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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,281	03/26/2004	Gerald Duane Larue	H0006214	2263

7590 12/06/2005

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EXAMINER	
TRIEU, THAI BA	

ART UNIT	PAPER NUMBER
3748	

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/812,281	LARUE ET AL.	
	Examiner	Art Unit	
	Thai-Ba Trieu	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23 and 25-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26 and 27* is/are allowed.

6)☒ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *10-12,19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 10/27/2005
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 27, 2005 has been entered.

Claim 25 was amended.

In view of newly discovery prior art, the indicated allowable subject matter of claims 1-23 and 26-28 has been withdrawn. A Non-Final rejection is set forth below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Fisher et al. (Patent Number 5,131,807).

Fischer discloses a turbocharger comprising:

a compressor (36) comprising a compressor housing and a compressor wheel mounted in the compressor housing (See figure 3);

a turbine (12) comprising a turbine housing and a turbine wheel mounted in the turbine housing (See Figure 3);

a shaft (not Numbered) connecting the compressor wheel to the turbine wheel (See Figure 3);

a one-piece center housing (Not Numbered) disposed between and mounted to the compressor and turbine housings (See Figure 3), the center housing defining a bore that receives the shaft therethrough (See Figure 3); and

a hydrodynamic foil bearing assembly (24, 26, 28) mounted in the bore of the center housing rotatably supporting the shaft, and comprising a foil thrust bearing assembly (24), a first foil journal bearing (26) located between the compressor wheel and the foil thrust bearing assembly (24), and a second foil journal bearing (28) located between the foil thrust bearing assembly (24) and the turbine wheel (See Figure 3);

wherein the center housing defines a cooling air supply passage (via 22) leading into the bore adjacent the thrust bearing assembly (24) for supplying cooling air to the foil thrust bearing assembly, the journal bearings (26, 28) define cooling passages arranged to receive said cooling air after said cooling air has cooled the foil thrust bearing assembly (24), and the center housing defines cooling air discharge passages (via 34) arranged to receive said cooling air after said cooling

air has cooled the foil journal bearings (26, 28) (See Figure 3, Column 2, lines 14-32).

Claims 20-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Swinton et al. (Pub. Number US 2002/00197928 A1).

Swinton discloses a hydrodynamic foil bearing assembly installable as a unit into a turbocharger, and comprising:

a foil thrust bearing assembly (Not Numbered) comprising an annular thrust disk and a pair of annular foil thrust bearings (Not Numbered) respectively disposed adjacent opposite faces of the thrust disk (See Figure 4); and

a foil journal bearing assembly (328') comprising a pair of annular journal bearing carriers mounting a journal foil assembly along an inner surface of each annular bearing carrier, the annular bearing carriers respectively disposed on opposite sides of the foil thrust bearing assembly with the annular bearing carriers being connected to each other so as to capture the foil thrust bearing assembly therebetween; and the thrust disk having a portion extending radially inwardly beyond the journal foil assemblies for connection to a shaft of a turbocharger (See Figure 4, paragraph [0070]-[0077]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Fortmann et al. (Patent Number 4,402,618).

Fischer discloses the invention as recited above; however, Fischer fails to disclose a first annular bearing carrier and a second annular bearing carrier.

Fortmann teaches that it is conventional in the bearing art, to utilize the first foil journal bearing (85) comprising a first annular bearing carrier (90) formed separately from and fixedly mounted in the center housing, and the second foil journal bearing (85) comprising a second annular bearing carrier formed separately from the center housing and first annular bearing carrier (90) and fixedly mounted in the center housing, each annular bearing carrier (90) mounting a foil along an inner surface of the annular bearing carrier (See Figure 1, Column 2, lines 67-68, and Column 3, lines 1-13).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a first annular bearing carrier and a second annular bearing carrier, as taught by Fortmann, to improve the efficiency of the Fischer device, since the use thereof would have prevented the accommodation of excessive rotor axial displacements.

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Fortmann et al. (Patent

Number 4,402,618), and further in view of either Nishijima et al. (Pub. Number US 2003/0169951 A1), or Hoffmann et al. (Pub. Number US 2005/0012411 A1).

The modified Fischer discloses the invention as recited above; however, fails to disclose the annular bearing carriers being made of stainless steel and ceramic.

Nishijima/Hoffmann teaches that it is conventional in the foil bearing art, to utilize the annular bearing carriers being made of stainless steel and ceramic (See Figures 5 and 14, Paragraph [0101] of Nishijima; and Paragraph [0016] of Hoffmann).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the annular bearing carriers being made of stainless steel and ceramic, as taught by Nishijima/Hoffmann, to improve the efficiency of the modified Fischer device, since the use thereof would have reduced the heat transfer from the turbine to the foils.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Fortmann et al. (Patent Number 4,402,618), and further in view of Obara et al. (Pub. Number US 2002/0039461 A1).

The modified Fischer discloses the invention as recited above; however, fails to disclose the position of annular bearing carriers.

Obara teaches that it is conventional in the bearing art, to utilize each annular bearing carrier being mounted in the center housing by an undulating ring (18) mounted about the annular bearing carrier and abutting an inner surface of the bore in the center housing, the undulating rings helping to thermally isolate the foils from heat transfer

from the turbine and serving to radially locate the annular bearing carriers in the bore of the center housing (See Figures 1, 5-6, and Paragraph [0035]-[0036]).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the position of annular bearing carriers, as taught by Obara, to improve the rotational accuracy of the bearings in the modified Fischer device.

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Swinton et al. (Pub. Number US 2002/0097928 A1).

Fischer discloses the invention as recited above; however, Fischer fails to disclose the structural details of the foil thrust bearing assembly.

Swinton teaches that it is conventional in the foil thrust bearing art, to utilize the foil thrust bearing assembly comprising an annular thrust disk (not Numbered) and a pair of annular foil thrust bearings (328') respectively disposed adjacent opposite faces of the thrust disk, the annular bearing carriers disposed on opposite sides of the foil thrust bearing assembly with the annular bearing carriers being connected to each other so as to capture the foil thrust bearing assembly therebetween (See Figure 4); the thrust disk (Not Numbered) having a radially inner portion extending to a smaller radius than the inner surfaces of the annular bearing carriers, and the shaft connecting the turbine wheel to the compressor wheel comprising a stepped shaft (322) and a shaft sleeve, the stepped shaft (322) having a larger-diameter portion connected to the turbine wheel and

journaled in the second journal bearing with an end of the larger-diameter portion abutting one side of the radially inner portion of the thrust disk, the stepped shaft having a smaller-diameter portion connected between the compressor wheel and the larger-diameter portion and extending through a central hole in the thrust disk, and the shaft sleeve being sleeved over and fixedly joined to the smaller-diameter portion and being journaled in the first journal bearing with an end of the shaft sleeve abutting an opposite side of the radially inner portion of the thrust disk (See Figure 4).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the structural details of the foil thrust bearing assembly, as taught by Swinton, to improve the efficiency of the Fischer device.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Johnston et al. (Patent Number 5,857,332).

Fischer discloses the invention as recited above; however, fails to disclose the center housing defining a water jacket therein for circulating cooling water for cooling the foil bearing assembly.

Johnston teaches that it is conventional in the bearing systems for a motor assisted turbocharger of the internal combustion engine art, to utilize the center housing having a water jacket therein for circulating cooling water for cooling the foil bearing assembly (See Column 3, lines 47-50).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the center housing defining a water jacket therein for circulating cooling water for cooling the foil bearing assembly, as taught by Johnston, to improve the efficiency of the Fischer device.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Fortmann et al. (Patent Number 4,402,618), and further in view of Adeff (Patent Number 5,890,881).

Fischer discloses the invention as recited above; however, fails to disclose seal rings, the position of each seal ring and the material of the seal rings.

Fortmann teaches that it is conventional in the bearing art, to utilize a first seal ring (110) disposed about an outer surface of the shaft adjacent the compressor wheel and a second seal ring (110) disposed about an outer surface of the shaft adjacent the turbine wheel, the seal rings being radially compressed between the shaft and stationary surfaces of the turbocharger for sealing the bearing assembly (See Figure 1).

Additionally, Adeff teaches that it is conventional in the turbocharger rotating seal, to utilize the seal ring being made of metal (66, 68) (Column 3, lines 64-67).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized seal rings, the position of each seal ring, as taught by Fortmann; and the material of the seal rings, as taught by Adeff, to improve the efficiency of the Fischer device.

Claims 13-14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Fortmann et al. (Patent Number 4,402,618), and further in view of Obara et al. (Pub. Number US 2002/0039461 A1).

Fischer discloses a turbocharger comprising:

a compressor (36) comprising a compressor housing and a compressor wheel mounted in the compressor housing (See figure 3);

a turbine (12) comprising a turbine housing and a turbine wheel mounted in the turbine housing (See Figure 3);

a shaft (not Numbered) connecting the compressor wheel to the turbine wheel (See Figure 3);

a center housing (Not Numbered) disposed between and mounted to the compressor and turbine housings (See Figure 3), the center housing defining a bore that receives the shaft therethrough (See Figure 3); and

a hydrodynamic foil bearing assembly (24, 26, 28) mounted in the bore of the center housing rotatably supporting the shaft, and comprising a foil thrust bearing assembly (24), a first foil journal bearing (26) located between the compressor wheel and the foil thrust bearing assembly (24), and a second foil journal bearing (28) located between the foil thrust bearing assembly (24) and the turbine wheel (See Figure 3).

However, Fischer discloses the invention as recited above; however, fails to disclose a first annular bearing carrier, a second annular bearing carrier, and an undulating ring.

Fortmann teaches that it is conventional in the bearing art, to utilize the first foil journal bearing (85) comprising a first annular bearing carrier (90) formed separately from and fixedly mounted in the center housing, and the second foil journal bearing (85) comprising a second annular bearing carrier formed separately from the center housing and first annular bearing carrier (90) and fixedly mounted in the center housing, each annular bearing carrier (90) mounting a foil along an inner surface of the annular bearing carrier (See Figure 1, Column 2, lines 67-68, and Column 3, lines 1-13).

Additionally, Obara teaches that it is conventional in the bearing art, to utilize an undulating ring (18) mounted about an outer surface of the bearing carrier between the bearing carrier and inner surface of the bore in the center housing, the undulating ring radially locating the journal bearing and provide thermal isolation between the bearing carrier and the center housing; and the undulating rings comprising tolerance rings (18) (See Figures 1, 5-6, and Paragraph [0035]-[0036]).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a first annular bearing carrier and a second annular bearing carrier, as taught by Fortmann; as well as, an undulating ring, as taught by Obara, to improve the efficiency of the Fischer device, since the use thereof would have prevented the accommodation of excessive rotor axial displacements.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Fortmann et al. (Patent Number 4,402,618) and Obara et al. (Pub. Number US 2002/0039461 A1), and

further in view of either Nishijima et al. (Pub. Number US 2003/0169951 A1), or Hoffmann et al. (Pub. Number US 2005/0012411 A1).

The modified Fischer discloses the invention as recited above; however, fails to disclose the annular bearing carriers being made of stainless steel and ceramic.

Nishijima/Hoffmann teaches that it is conventional in the foil bearing art, to utilize the annular bearing carriers being made of stainless steel and ceramic (See Figures 5 and 14, Paragraph [0101] of Nishijima; and Paragraph [0016] of Hoffmann).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the annular bearing carriers being made of stainless steel and ceramic, as taught by Nishijima/Hoffmann, to improve the efficiency of the modified Fischer device, since the use thereof would have reduced the heat transfer from the turbine to the foils.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Malabre et al. (Patent Number 4,850,721).

Fischer discloses a turbocharger comprising:

a compressor (36) comprising a compressor housing and a compressor wheel mounted in the compressor housing (See figure 3);

a turbine (12) comprising a turbine housing and a turbine wheel mounted in the turbine housing (See Figure 3);

a shaft (not Numbered) connecting the compressor wheel to the turbine wheel (See Figure 3);

a one-piece center housing (Not Numbered) disposed between and mounted to the compressor and turbine housings (See Figure 3), the center housing defining a bore that receives the shaft therethrough (See Figure 3); and

a hydrodynamic foil bearing assembly (24, 26, 28) mounted in the bore of the center housing rotatably supporting the shaft, and comprising a foil thrust bearing assembly (24) retained between first and second foil journal bearings (26, 28) (See Figure 3).

However, Fischer fails to disclose the bearing cartridge being insertable as a unit.

Malabre teaches that it is conventional in the hydrodynamic bearing art, to utilize the bearing cartridge being insertable as a unit into the bore of the center housing from an end of the center housing adjacent the compressor (See Column 2, lines 26-44).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the bearing cartridge being insertable as a unit, as taught by Malabre, to improve the performance efficiency of the Fischer device.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Malabre et al. (Patent Number 4,850,721), and further in view of Fortmann et al. (Patent Number 4,402,618).

The modified Fischer discloses the invention as recited above; however, fails to disclose a first annular bearing carrier and a second annular bearing carrier.

Fortmann teaches that it is conventional in the bearing art, to utilize the first foil journal bearing (85) comprising a first annular bearing carrier (90) formed separately from and fixedly mounted in the center housing, and the second foil journal bearing (85) comprising a second annular bearing carrier formed separately from the center housing and first annular bearing carrier (90) and fixedly mounted in the center housing, each annular bearing carrier (90) mounting a foil along an inner surface of the annular bearing carrier (See Figure 1, Column 2, lines 67-68, and Column 3, lines 1-13).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a first annular bearing carrier and a second annular bearing carrier, as taught by Fortmann, to improve the efficiency of the modified Fischer device, since the use thereof would have prevented the accommodation of excessive rotor axial displacements.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (Patent Number (5,131,807), in view of Malabre et al. (Patent Number 4,850,721) and Fortmann et al. (Patent Number 4,402,618), and further in view of Swinton et al. (Pub. Number US 2002/0097928 A1).

The modified Fischer discloses the invention as recited above; however, fails to disclose the structural details of the foil thrust bearing assembly.

Swinton teaches that it is conventional in the foil thrust bearing art, to utilize the foil thrust bearing assembly comprising an annular thrust disk (not Numbered) and a pair of annular foil thrust bearings (328') respectively disposed adjacent opposite faces

of the thrust disk, the annular bearing carriers disposed on opposite sides of the foil thrust bearing assembly with the annular bearing carriers being connected to each other so as to capture the foil thrust bearing assembly therebetween (See Figure 4) (See Figure 4).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the structural details of the foil thrust bearing assembly, as taught by Swinton, to improve the efficiency of the Fischer device.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swinton et al. (Pub. Number US 2002/00197928 A1), in view of Obara et al. (Pub. Number US 2002/0039461 A1).

Swinton discloses the invention as recited above; however, fails to disclose the position of annular bearing carriers.

Obara teaches that it is conventional in the bearing art, to utilize each annular bearing carrier being mounted in the center housing by an undulating ring (18) mounted about the annular bearing carrier and abutting an inner surface of the bore in the center housing, the undulating rings helping to thermally isolate the foils from heat transfer from the turbine and serving to radially locate the annular bearing carriers in the bore of the center housing (See Figures 1, 5-6, and Paragraph [0035]-[0036]).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the position of annular bearing carriers, as taught by Obara, to improve the rotational accuracy of the bearings in the Swinton device.

Claim 25 is rejected under 35 U.S.C. 103(c) as being unpatentable over Ghizawi (Patent Number 6,668,553 B1), in view of Emerson et al. (Patent Number 5,529,464), and further in view of Sugihara et al. (Pub. Number JP 07-208189 A).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Ghizawi discloses a turbocharger (10) comprising:

a compressor (14) comprising a compressor housing (Not Numbered) and a compressor wheel (Not Numbered) mounted in the compressor housing (See Figure 1);

a turbine (12) comprising a turbine housing (Not Numbered) and a turbine wheel mounted (Not Numbered) in the turbine housing (See Figure 1);

a shaft (16) connecting the compressor wheel to the turbine wheel (See Figure 1);

a center housing disposed between and mounted to the compressor and turbine housings (See Figure 4), the center housing defining a bore that receives the shaft therethrough (See Figure 4);

a bearing assembly (18) mounted in the bore of the center housing rotatably supporting the shaft (16), wherein the center housing defines a cooling air supply passage (via 52, 54) leading into the bore for supplying cooling air to the bearing assembly (18), and cooling air discharge passages arranged to receive said cooling air after said cooling air has cooled the bearing assembly (See Figure 1);

a cooling air supply line (52, 54) coupled to the cooling air supply passage of the center house (See Figure 1); and

a filter (24) arranged in the cooling air supply line for removing oil vapor from the cooling air before cooling air is supplied to cool the bearing assembly (18).

However, Ghizawi fails to disclose a bearing assembly being a hydrodynamic foil bearing assembly, and the structural details of a cooling air supply line.

Emerson teaches that it is conventional in the turbopump art, to utilize a hydrodynamic foil bearing assembly (88, 114, 34, 112A, 112B) (See Figures 1-2, Column 4, lines 1-18).

Additionally, Sugihara teaches that it is conventional in the art of supercharger cooling device of an internal combustion engine, to utilize a cooling a cooling air supply line (from 4 to 8) coupled from an engine intake duct downstream of the compressor to the cooling air supplying passage of the center housing (See Figure 1).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized hydrodynamic foil bearing assembly, as taught by Emerson, and the structural details of a cooling air supply line, as taught by Sugihara, to improve the efficiency and reliability of the Ghizawi cooling system for a turbocharger.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roby et al. (Patent Number 6,263,672), in view of Kang et al. (Patent Number 6,964,522 B2).

Robby discloses a method for operating a turbocharger having bearings (53) and having a turbine with a variable nozzle (332, 333) , wherein the variable nozzle is structured and arranged to receive exhaust gas from an engine and supply the exhaust gas to a turbine of the turbocharger, the method comprising partially closing the variable

nozzle at engine idle condition so as to increase the idle speed of the turbocharger (See Figure 8 and 9, Column 6, lines 22-31).

However, Roby fails to disclose foil bearings and their function.

Kang teaches that it is conventional in the hydrodynamic foil bearing art, to utilize foil bearings being applied in the turbocharger and being prevented form stalling and stopping during the engine idle condition to increase the turbocharger speed (See Column 2, lines 37-44).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized foil bearings and their function, as taught by Kang, to improve the efficiency of the Roby device.

Allowable Subject Matter

Claims 26-27 are allowed.

Claims 10-12, 19, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The IDS (PTO-1449) filed on October 27, 2005 has been considered. An initialized copy is attached hereto.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (571) 272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTB
November 30, 2005

Thai-Ba Trieu
Primary Examiner
Art Unit 3748